

WHAT IS CLAIMED IS:

1. A method for detecting a disease or autoimmune state in a mammal, comprising:

immobilizing a disease or autoimmune antigen on a substrate to form a spot;
contacting said immobilized antigen with a sample from said mammal under conditions such that any antibodies from said mammal specific for said antigen bind thereto;

contacting said antibodies from said mammal bond to said antigen with a metal-antibody conjugate, wherein the antibody of the metal-antibody conjugate is specific for IgG of the species of mammal being tested;

applying a voltage between electrodes which are separated by said spot; and
measuring a current across said spot, wherein conduction of a current is indicative of the disease or autoimmune state.

2. A method for detecting the presence of an antigen, comprising:

immobilizing an antibody specific for said antigen on a substrate to form a spot;

contacting said immobilized antibody with a sample under conditions such that any antigen present in the sample binds to said immobilized antibody;

contacting said immobilized antibody-bound antigen with a metal-antibody conjugate, wherein the antibody of the metal-antibody conjugate is specific for said antigen;

applying a voltage between electrodes which are separated by said spot; and
measuring a current across said spot, wherein conduction of a current is indicative of the presence of said antigen.

3. A method for monitoring protein degradation, comprising:

- a) immobilizing a metal-protein conjugate on a substrate to form a spot;
- b) applying a voltage between electrodes which are separated by said spot;
- c) measuring a current across said spot; and
- d) repeating steps b-c over time to monitor a change in the current, which change is related to protein degradation.